REMARKS

Claims 1-31 are pending in this application. Claims 13, 14, 20-22, 24 and 26 are canceled without prejudice or disclaimer, claims 1, 2, 9, 10, 15 and16 are amended, and claims 32-40 are newly added herein. Upon entry of this amendment, claims 1-12, 15-19, 23, 25 and 27-40 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for the amendments to the existing claims is detailed below. Support for the new claims is as follows:

New claim 32 depends on claim 29. Support for the "95:5 to 30:70" range limitation may be found, for example, in original claim 2.

Support for new claim 33 can be found on page 80, lines 5 to 23 and page 81, lines 13 to 16 of the specification.

Support for new claim 34 can be found on page 80, lines 5 to 23 of the specification.

Support for new claims 35 to 40 may be found in original claims 21 to 26.

Claims 13 and 14 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. (Office action paragraph no. 1)

The rejection is moot in view of the cancellation of claims 13 and 14 without prejudice or disclaimer.

Claims 1, 3-9, 11-15, 17-18 and 27-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 07-278374. (Office action paragraph no. 3)

Claims 2, 10, 16, 19-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 07-278374, and further in view of Sadamitsu et al. US 2006/0091581. (Office action paragraph no. 5)

The rejections are overcome by the amendments to the claims.

In claims 1, 9 and 15, the ratio range of "10:0 to 30:70" has been amended to be "95:5 to 30:70." In claims 2, 10 and 16, the ratio range "95:5 to 30:70" has been amended to be "90:10 to 60:40." Support for this amendment can be found on page 29, lines 15 to 20 of the specification.

In claim 27, "R^{2}" has been amended to "R^{3}." Support for this amendment can be found on page 22, lines 13 to 17 of the English specification.

Scope of the amendment to claims 1-12, 15-19, 23, 25 and 29-32

Claims 1-12, 15-19, 23, 25 and 29-32, as amended, are directed to an invention which uses (A) a specific amide-based compound and (B) a specific fatty acid metal salt as indispensable ingredients.

The present invention provides control of the crystallization rate of a polyolefin-based resin by incorporating (A) the specific amide-based compound and (B) the specific fatty acid metal salt in a polyolefin-based compound at a specific weight ratio, as described on page 5, lines 19 to 24 of the specification.

More specifically, as shown in Fig. 8, in the case where the resin temperature T during molding (molding temperature) is set to a temperature equal to or more than the polyolefin-based resin melting temperature Tm and equal to or below the transition temperature of storage modulus during heating Tsh (molding method (I) of Fig. 8), the crystallization rate of the polyolefin-based

resin can be increased when the proportion of (B) the specific fatty acid metal salt is increased (region IA)→region (IIAB)) (see Item (e) of the specification, page 6, line 23, to page 7, line 7).

Further, in the case where the resin temperature T during molding (molding temperature) is set to a temperature higher than the transition temperature of storage modulus during heating Tsh (molding method (II) shown in figure 8), the crystallization rate of the polyolefin-based resin can be reduced when the proportion of (B) the specific fatty acid metal salt is increased (domain (IIA)→(IIAB)) (see Item (f) of the specification, page 7, lines 8 to 15).

As described on page 65, line 17, to page 66, line 11, controlling the crystallization rate is important for the following reasons.

Depending on the type of molding methods and resins to be molded, a rapid crystallization rate of a resin may sometimes hinder the processing. For example, if the crystallization rate of a polyolefin-based resin is not within a suitable range, a homogenous molded product is difficult to obtain by injection molding of large-size products, filmmolding, sheet molding, blow forming, or the like.

On the other hand, it would be industrially advantageous, for example, in the field of injection molding for small-size products, if the crystallization rate of polyolefin-based resins can be increased to shorten crystallization time so as to reduce production costs as much as possible.

Thus, if a method for controlling the crystallization rate of a polyolefin-based resin, or a resin composition in which the crystallization rate can be controlled is available, a wide range of processing can be realized without solely depending on the complicated procedures for determining molding machine variables, whereby an object of the invention is achieved.

Accordingly, the present invention controls crystallization rate by using (A) the specific amide-based compound and (B) the specific fatty acid metal salt as indispensable ingredients, and adjusting the proportion of (B) the specific fatty acid metal salt, thereby increasing the flexibility of setting the molding conditions during the molding process, consequently facilitating production of molded products having excellent properties.

Scope of the amendment to claims 27, 28 and 33-40

Meanwhile, although in amended claims 27, 28 and 33-40, a polyolefin-based resin containing (A) the specific amide-based compound, is an indispensable requirement, use of (B) the specific fatty acid metal salt is not indispensably required. However, the crystallization rate may, of course, be controlled by using both (A) the specific amide-based compound and (B) the specific fatty acid metal salt.

As described in Item (h) in the specification at page 8, lines 4 to 20, in the molding method (I), the molding is carried out at a resin temperature equal to or below the transition temperature Tsh of storage modulus during heating. Therefore, as shown in Fig. 7(I), the molding is carried out while the network of the amide-based compound is present, and the fibrous particles constituting the network structure are oriented, with the result that the polyolefin-based resin crystal lamellae can be oriented in the resulting molded product, consequently giving a molded product that is particularly excellent in rigidity (especially, Flexural modulus). In other words, even without (B) the specific fatty acid metal salt, the molding method (I) provides a molded product excellent in rigidity, and which shows an orientation degree of at least 2.

This is clearly seen from comparison between Examples I-1 to I-5 and Examples II-1 to II-5 of the specification (page 157 to 158, Tables 7 and 8). In Examples I-1 to I-5, the polypropylene-based resin formed by the molding method (I) ensures an orientation degree of at least 2 (Table 7) even without (B) the specific fatty acid metal salt. However, a polypropylene resin ensuring an orientation degree of at least 2 was not obtained by the molding method (II) described in Examples II-1 to II-5 (Table 8).

Regarding the rejection of claims 1-12, 15-19, 23, 25 and 29-32

In paragraph no. 6 of the Office Action, the Examiner asserts that Sadamitsu shows the incorporation of compounds falling within the scope of (2) at [0039] and it would be obvious to add the additional agent as disclosed at [0039] to the composition of JP 07-278374. The Examiner appears to be referring to general formula (2) in claim 1 which describes fatty acid metal salt (B) of the claims.

Applicant has attached a machine translation of JP 07-278374 to clarify the disclosure of this reference. JP 07-278374 discloses that the transparency of a polypropylene resin constituent has been improved by using one or more tricarboxylic acid-based amide compounds as a nucleating additive. In JP 07-278374, an amide-based compound corresponding to Component (A) is disclosed, but Component (B) (fatty metal salt) is mentioned only as one item of a large list of components and additives in [0033]. In other words, in JP 07-278374, Component (B) (fatty metal salt) is added only if needed, and mixing of an amide-based compound and fatty metal salt is not mentioned in the examples.

In Sadamitsu, there is no disclosure of an amide-based compound corresponding to Component (A). The amide-based compound disclosed in Sadamitsu is not a tri- or tetra- amide-based compound corresponding to Component (A) but is a di-amide compound. Also, in Sadamitsu, Component (B) (fatty metal salt) is only mentioned as one item of a large list of components and additives in paragraph [0039].

In summary, JP 07-278374 only mentions the applicability of Component (B) as one component or additive, and does not teach or suggest the crystallization rate control effect of a polyolefin-based resin by using a specific weight ratio of Component (A) to Component (B).

Sadamitsu only mentions the applicability of Component (B) as one component or additive for composition of polyolefin-based resin and merely teaches an amide compound that is completely different from the instant invention.

In contrast, the amended Claims 1-12, 15-19, 23, 25 and 29-32 of the present invention use the Components (A) and (B) as indispensable ingredients. Accordingly, the present invention controls crystallization rate by using (A) the specific amide-based compound and (B) the specific fatty acid metal salt as essential components, and adjusting the proportion of (B) the specific fatty acid metal salt, thereby expanding the flexibility of setting the molding conditions during the molding process, consequently facilitating the production of molded products having excellent properties. Such crystallization rate control is not taught or suggested by the cited references.

Accordingly, the amended 1-12, 15-19, 23, 25 and 29-30, and new claim 32 of the present invention are not obvious over JP 07-278374 and Sadamitsu, taken separately or in combination.

Regarding the rejection of claims 27, 28 and new claims 33-40

As described above, the processes of the new claims 33-40 carry out molding while the network of the amide-based compound is present (molding method (I)), thereby orientating the fibrous particles, consequently crystallizing a polyolefin-based resin from an oriented manner. The processes according to the new claims 33-40 provide a polyolefin-based resin molded product having an oriented degree of at least 2 and excellent in rigidity, regardless of usage of (B) the specific fatty acid metal salt.

This is clearly seen from comparison between Example I-1 to I-5 and Examples II-1 to II-5 of the specification (Table 7). In Examples I-1 to I-5, the polypropylene-based resin formed by the molding method (I) ensures an orientation degree of at least 2 even without (B) the specific fatty acid metal salt. However, a polypropylene resin ensuring an orientation degree of at least 2 was not obtained by the molding method (II) according to Examples II-1 to II-5.

Further, claims 27 and 28 recite a polyolefin-based resin molded product having an oriented degree represented by the ratio of the (040) reflection intensity of the (110) reflection intensity determined by wide angle X-ray diffractometry of at least 2.

By crystallizing the polyolefin-based resin in an oriented manner as in the new claims 33-40, it is possible to obtain a molded product having a high orientation degree as with claims 27 and 28, i.e. mechanical strength, particularly a high rigidity (Flexural modulus).

As described above, JP 07-278374 only discloses that the transparency of the polypropylene resin constituent has been improved by using one or more tricarboxylic acid-based amide compounds as a nucleating additive. JP 07-278374 does not teach or suggest performing a molding process

while the network of an amide-based compound is present, the orientation of the fibrous particles, or the crystallization of a polyolefin-based resin in an oriented manner.

Sadamitsu does not disclose an amide-based compound corresponding to Component (A). Also, Sadamitsu discloses that "the present invention is characterized in that the amide compound is dissolved in the molten polypropylene-based resin and thereby rendered amorphous in the molding step, so as to inhibit the orientation of the β crystal layer as much as possible" ([0059] of Sadamitsu, emphasis added). On the other hand, the processes according to the new claims 33-40 provide a polyolefin-based resin molded product having an oriented degree of at least 2 and excellent in rigidity. The disclosure of Sadamitsu teaches away from the new claims 33-40.

Neither JP 07-238 374 nor Sadamitsu teaches or suggests performing a molding process while the network of an amide-based compound is present, the orientation of the fibrous particles, the crystallization of a polyolefin-based resin in an oriented manner, or the unexpected result that by crystallizing the polyolefin-based resin in an oriented manner as in the new claims 33-40, it is possible to obtain a molded product having a high orientation degree as with claims 27 and 28, i.e. mechanical strength, particularly a high rigidity (Flexural modulus).

Accordingly, amended claims 27 and 28 and new claims 33 to 40 are not obvious over JP 07-278374 and Sadamitsu.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Petition for Extension of Time
Amendment Fee Transmittal
English Translation of JP 07-278374

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